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Changes in General Practitioners' consultation frequency over time for patients with hypertension or anxiety/depression symptoms: a 10-year follow-up of the Norwegian HUNT study

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Abstract

Background: General Practitioners' (GPs') workload has been suggested to increase in many countries; how does this impact patient follow-up?
Objective: To investigate trends in GP consultation patterns for adults according to baseline hypertension and anxiety/depression symptoms and attribution of the GP to trend differences.
Methods: Prospective cohort study, linking survey data and clinical measurements from the Norwegian HUNT3 study (2006–08) with national administrative data on GP list assignment and consultations with GP services. We grouped participants aged 40–59 years according to sex and their baseline status regarding hypertension and anxiety/depression symptoms. We registered GP consultations in 2007–16 and used general estimation equation models to estimate the level of GP consultations per month per year during follow-up. We used multilevel models with participants nested in their assigned regular GP to calculate GP-level intra-class correlation coefficients, reflecting to what extent patients' consultation patterns could be attributed to the individual GP.
Results: In total, 47 550 HUNT3 participants were registered with 102 different GPs in Nord-Trøndelag County, Norway, in 2007. Adjusted for age, we observed an overall increase in GP consultations in 2007–16, particularly in those with a better health status at baseline. About 2% of the variance of patient consultations could be attributed to differences between GPs and 10% to the use of lengthy consultations. Out-of-hours consultations did not change much in the study period 2007–16.
Conclusion: Increased use of GP consultations, mainly among the healthiest participants, encourage further research into whether these patients displace patients with heavier and more complex needs.

Key words: Anxiety disorders, continuity of patient care, depression, general practice, hypertension, primary health care.

Key Messages

- General Practitioners (GPs) are reporting increased workload, recruitment and retention problems.
- We observed GP consultations in 2007–16 according to baseline health status.
- A general increase in GP consultations was observed during the study period.
- This increase was prominent among the healthier groups.
- Consultations in men with anxiety/depression decreased over the study period.
- Further research should explore if GPs spend more time on healthier patients.

Background

General practitioners (GPs) are key service providers in primary care (1), responsible for the coordination of services, preventive care, referral to secondary health care when needed, follow-up and monitoring (2). In addition to an ageing and more medically complex (3,4) population, many countries are shifting responsibilities from secondary to primary health care (5) (systemized in Norway through The Coordination Reform in 2012 (6)). A heavier caseload for GPs, together with increased public expectations about health/health services and advances in medicine, are key factors claimed to increase GPs workload (7,8) in many countries.

Recent studies have not only indicated an increased GP workload (8–10) but also GP recruitment and retention problems (11–13). Whether these changes have altered consultation patterns and the care patients receive from their GPs are unknown, and there is limited knowledge on differences between the GPs in the follow-up of their list population.

The aim of this study was to investigate GP consultation patterns in older adults from 2007 through 2016 and whether the development over time differed according to sex and baseline status regarding hypertension and symptoms of anxiety/depression. We also investigated whether consultation patterns changed after the initiation of the Norwegian Coordination Reform (1 January 2012). Both hypertension and anxiety/depression are common in the general population worldwide (14,15) with substantial impacts on individual and overall population health. To a large extent, hypertension and anxiety/depression are managed within the primary health care services and frequent causes of patient contact in general practice (16). Otherwise, these conditions differ in most aspects. While prevention and follow-up of hypertension have been standardized and regulated through GP guidelines (17), no direct recommendations exist regarding anxiety/depression. Our hypothesis was that the patient groups would show different GP consultation patterns over time and that consultations for those with chronic conditions would increase after the Coordination Reform. Since all Norwegian inhabitants are entitled to a regular GP within a list-based system (2) (implemented in 2001; in 2016, the average number of patients on a GP list was 1120 (18)), we also wanted to investigate how much of the variance in consultation patterns could be attributed to the specific GP and whether this had changed with time.

Method

This is a prospective cohort study, linking survey data and clinical measurements from the Norwegian HUNT3 study (2006–08) with national administrative data on GP list assignment and consultations with GP services. All residents of Nord-Trøndelag County in Norway, aged ≥20 years, were invited to participate in the third wave of the HUNT Study (HUNT3, 2006–08; http://www.ntnu.edu/hunt/databank). Participants answered questionnaires and underwent physical examinations. Of the 93 860 invited, 54% participated (19). Details regarding study procedures (19) and non-participation (20) are described elsewhere.

HUNT3 data was linked to individual-level data on primary health care use (Control and Payment of Health Reimbursement—KUHR) (21), GP affiliation (Norwegian General Practitioner register (22)), education and demographic information (Statistics Norway (23)) (see Supplementary Fig. 1). For inclusion, participants had to be ≥20 years by 31 December 2007 and they had to have filled in the HUNT3 questionnaire. Our observation period was from 1 January 2007 to 31 December 2016 with information on health care use registered throughout the period.

Patient groups

Specially trained nurses and technicians conducted the clinical examinations, and we used the mean blood pressure of the second and third measurements. The cut-off for hypertension was systolic blood pressure >140 mmHg and/or diastolic blood pressure >90 mmHg (24). We combined the measured blood pressure with the response to the question 'Do you currently use antihypertensive medication, or have you done so previously?' (response alternatives yes/no), resulting in the following groups:

> 'Hypertension': current/previous antihypertensive medication regardless of measured blood pressure.
> 'Non-medicated hypertension': hypertension at examination, *no* current/previous antihypertensive medication.
> 'Normotensive': normotensive at examination, *no* current/previous antihypertensive medication.

The 14-item Hospital Anxiety and Depression Scale measured symptoms of anxiety and depression (HADS, four-point Likert scale scored 0–3 (25)), where seven items measured symptoms of depression (HADS-D) and anxiety (HADS-A), respectively. We used a cut-off score at ≥8/21, concordant with validation studies reporting sensitivity and specificity for both anxiety and depression to be between 0.80 and 0.90 (26). We combined the HADS score with the response to the question 'Have you had, or do you have any of the following: mental health problems you sought help for?' (response alternatives yes/no), resulting in the groups:

> 'Anxiety/depression symptoms *having* sought help for mental health problems'
> 'Anxiety/depression symptoms *never* sought help for mental health problems'
> 'Normal range of anxiety/depression symptoms, *having* sought help for mental health problems'
> 'Normal range of anxiety/depression symptoms, *never* sought help for mental health problems'.

Outcome

Our main outcome was regular GP consultations from 2007 through 2016. Additional outcomes were regular GP consultations exceeding 20 minutes and out-of-hours GP consultations.

Covariates

HUNT3 provided birth year, sex and health variables. Self-reported health and physical examination was also used to construct a co-morbidity score; hypothesizing that the higher the level of co-morbidity, the higher the level of consultations, we adjusted for the level of co-morbidity on a continuous scale. Our analysis included 21 chronic diseases/conditions (detailed description found elsewhere (3)). Any case of missing data was defined as the absence of the disease in question. We calculated the co-morbidity score of each participant in the different patient groups, excluding the condition in question (maximum 20 points/other diseases or conditions). The highest achieved level of education by 2007 was measured in three categories: 'no/primary/lower secondary school', 'upper secondary school' and 'college/ university'. Characteristics of the GPs and their patient lists included the GPs' sex, being a GP specialist or not and birth decade (born in 1940s, 1950s and so on, where 1970s also included 1980–81). Participants were censored at migration or death.

Analysis

We used generalized estimation equating (GEE) models (27) to estimate the level of GP consultations per year in 2016 compared to 2007, adjusted for increasing age during follow-up. GEE models assessed the associations between baseline health and GP consultations per month per year from 2007 through 2016. Separate analyses were performed for baseline hypertension status (comparing three groups: hypertension, non-medicated hypertension and normotensive) and anxiety/depression status (comparing four groups according to anxiety and depression symptom level and previous help-seeking for mental problems). Main analyses were restricted to the age cohort 40–59 years (in 2007), avoiding the younger age groups with low HUNT3 participation and the older participants, who were more likely to exit the GP scheme by being institutionalized (Norwegian GPs keep institutionalized patients on their list (2) even though they are cared for by others, and we did not have data enabling us to sensor for institutional stay). The outcome measure was monthly consultation (consultation versus no consultation); we adjusted for year, educational level and increasing age during follow-up and included an interaction term between health status and year. Since help-seeking behaviour differs between the sexes (28), we did separate analyses for men and women. Additional analyses were performed with adjustment for co-morbidity. Estimates from the regression analyses were used to calculate the percentage of people with consultation for each month and year during follow-up. All analyses were repeated for out-of-hours consultations (both sexes together). We also analysed the number of consultations per year as a continuous outcome variable.

We used multilevel models with participants nested in their assigned GP to calculate GP-level intra-class correlation (ICC) coefficients, reflecting to what extent patients' consultation patterns could be attributed to the individual GP. We used the number of yearly consultations per participant as the basis for our calculations and adjusted for patient age and sex. Analyses were repeated for each of our consultation outcomes: regular consultations, consultations exceeding 20 minutes and out-of-hours consultations. We performed separate analyses for each year during follow-up, selecting 2007 (the first year), 2011 (in the middle/the year before The Coordination Reform) and 2016 (the last year of follow-up) for presentation. Supplementary analyses included adjustment for additional participant characteristics (education and co-morbidities) and GP characteristics (sex, age and whether specialist in GP medicine or not). We did sub-analyses of participants with the same GP in 2016 as in 2007 (as a sensitivity analysis).

Results

At baseline (2007), 47 550 participants were registered with 102 different GPs in Nord-Trøndelag County. Each GP had on average 1298 [standard deviation (SD) 295] patients on their list, 523 (SD 154) being HUNT3 participants (see Table 1).

GP consultations

The study population, regardless of age group or baseline health status, had an increase of 0.30 [95% confidence interval (CI) 0.26 to 0.34] GP consultations per year when comparing the number of consultations in 2016 with the number of consultations in 2007, adjusted for increasing age during follow-up (data not shown).

For participants aged 40–59 at baseline (see Figs. 1 and 2), the level of monthly GP consultations was higher among women than men and lower among the healthier. In general, we observed an increasing trend in the level of monthly GP consultation during the study period. This increase was pronounced among the healthiest groups. The only groups who had a steeper increase were those with non-medicated hypertension, with 5% increase for both sexes [95% CI 3% to 7% (women); 3% to 6% (men)] from 2007 to 2016. For these groups, a rapid increase in monthly GP consultation was seen from 2007 to 2008, and non-medicated hypertensive men continued to have a higher level of consultations throughout the study period. In contrast, monthly consultations decreased during the study period for men with a high level of anxiety and/or depression symptoms having sought help for mental health problems from 26% (95% CI 24 to 28) in 2007 to 22% (95% CI 20 to 24) in 2016. The corresponding changes in the number of yearly consultations from 2007 to 2016 are shown in Supplementary Tables 1–2.

Intra-class correlations

About 2–3% of the variance in consultations could be attributed to differences between GPs [ICC 0.03 (95% CI 0.02 to 0.04) in 2007 and 0.02 (95% CI 0.02 to 0.03) in 2016]. The use of out-of-hours consultations differed even less between GP affiliation [ICC 0.02 (95% CI 0.01 to 0.02) in 2006 and 0.01 (95% CI 0.01 to 0.01) in 2016]. There was a larger variability between GPs in consultations exceeding 20 minutes, explaining 8% of the variance and increasing over time [ICC 0.08 (95% CI 0.06 to 0.11) in 2007 and 0.10 (95% CI 0.08 to 0.13) in 2016; see Table 2].

ICC estimates were not substantially changed in the analysis with additional adjustments for patient and/or GP characteristics (see Supplementary Table 3) or in the analysis including only the sub-sample of HUNT3-participants who had the same GP in 2007 and 2016.

Additional analysis; out-of-hours consultations and adjustments for co-morbidity

Those with anxiety/depression symptoms 'having' sought help for mental health at baseline had the highest level of monthly out-of-hours consultations in 2007 of 2.4% (95% CI 2.1 to 2.7), decreasing to 1.8% (95% CI 1.5 to 2.0) in 2016. All other groups had lower and stable levels of monthly consultations during the study period (see Supplementary Figs. 2 and 3). Additional adjustment for co-morbidity did not substantially alter any of our results (see Supplementary Figs. 4–7).

Discussion

Summary

There was an overall increase in regular GP consultations from 2007 to 2016, particularly for healthier participants. We did not observe

Table 1. Participants and characteristics at baseline (2007)

	Female	Male	Total
Total *n* (%)	26 001 (55%)	21 549 (45%)	47 550 (100%)
Age groups *n* (%)			
20–39 years	5678 (22%)	4094 (19%)	9772 (21%)
40–59	10 912 (42%)	9387 (44%)	20 299 (43%)
60–79	7980 (31%)	7065 (33%)	15 046 (32%)
80+	1430 (6%)	1003 (5%)	2433 (5%)
Educational level *n* (%)			
Primary	6191 (24%)	4294 (20%)	10 485 (22%)
Secondary	12 558 (48%)	12 626 (59%)	25 184 (53%)
Tertiary	7252 (28%)	4629 (21%)	11 881 (25%)
Co-morbid conditions (range 0–21) mean (SD)	2.15 (1.89 SD)	1.79 (1.66 SD)	1.99 (1.80 SD)
Hypertension groups (shown for age group 40–59)			
Hypertension[a]	1559 (14%)	1420 (15%)	2979 (15%)
Non-medicated hypertension[b]	339 (3%)	767 (8%)	1106 (5%)
Normotensive[c]	8977 (82%)	7157 (76%)	16 134 (79%
Missing[d]	37 (0.3%)	43 (0.5%)	80 (0.4%)
Anxiety/depression groups (shown for age group 40–59)			
Anxiety/depression symptoms,[e] having sought help for mental health problems[f]	764 (7%)	402 (4%)	1166 (6%)
Anxiety/depression symptoms,[e] 'never' sought help for mental health problems[f]	945 (9%)	737 (8%)	1682 (8%)
'Normal' range anxiety/depression symptoms,[g] having sought help for mental health problems[f]	1045 (10%)	492 (5%)	1537 (8%)
'Normal' range anxiety/depression symptoms,[g] 'never' sought help for mental health problems[f]	5801 (53%)	5316 (57%)	11 117 (55%)
Missing[h]	2357 (22%)	2440 (26%)	4797 (24%)

[a]Current/previous antihypertensive medication regardless of measured blood pressure at baseline.

[b]Systolic blood pressure >140 and/or diastolic blood pressure >90 and no current/previous antihypertensive medication at baseline.

[c]Systolic blood pressure ≤140 and diastolic ≤90 and no current/previous antihypertensive medication at baseline.

[d]Missing physical examination; did not have their blood pressure measured at participation in HUNT3/at baseline.

[e]HADS-A ≥8 and/or HADS-D ≥8 at baseline.

[f]Having (or 'never' having) sought help for mental health problems at baseline.

[g]HADS-A <8 and HADS-D <8 at baseline.

[h]Missing the extra form regarding mental health; did not fill in the additional form when participating in HUNT3/at baseline.

any change in consultation patterns related to the implementation of The Coordination Reform (6) but a substantial increase in consultations during the year after HUNT3 participation for those registered with an elevated blood pressure measurement.

Women with a high anxiety and/or depression symptom level having sought help for mental health problems had the most frequent consultations with their GP. Interestingly, men with a high anxiety and/or depression symptom level having sought help for mental health problems decreased their GP consultations during the period.

Overall, the GPs provided consultations in a fairly similar amount with 2–3% of the variance attributed to differences between GPs. However, regarding the use of consultations exceeding 20 minutes, about 8–10% of the variance could be attributed to the GPs.

Strengths and limitations

In this study, we followed GP consultation patterns for a large population over a 10-year period, linking baseline health status with prospective accurate registry information. The large study provided relatively precise estimates, even in the stratified analyses. The Norwegian GP scheme with <1% non-participants since the start in 2001 (18) made it possible to link each individual in the population to their regular GP.

The HUNT study is a fairly representative sample although, non-participants to some extent may have a higher prevalence of both cardiovascular disease and psychiatric disorders than participants (20). Our groups were defined based on a combination of clinical examination and self-reported information from questionnaires. More precise information on diagnoses at baseline could have been

an advantage, but this was not feasible given the size of the study and availability of routine patient data from Norwegian registries. Also, diagnostic coding by GPs has low accuracy (29), partly because GP consultations cannot be categorized easily (30), and patients tend to address several concerns per consultation (31). Using information from the HUNT Study allowed us to group people according to baseline symptoms making the groups more comparable across different health care systems.

Although our results must be interpreted in relation to the Norwegian system with a personal GP for each individual citizen, we believe that the findings have relevance for other health care systems with a well-developed and accessible health care system.

Comparison with existing literature

We found an overall increase in the level of monthly consultations and the absolute number of yearly consultations in concordance with the increased practice of consultation rates in English general practice in the same time period (7,9). A common explanation is that it reflects an older and more multimorbid population. Our study showed that middle-aged patients with the presumably lowest health risk contributed the most to the increased GP workload during the study period in terms of patient consultations. The lack of accompanying increase for out-of-hours consultations indicates that the prevalence of acute and more serious health problems did not change during the study period.

In concordance with expectations and previous research (28), women had a higher level of GP consultations than men. The lower
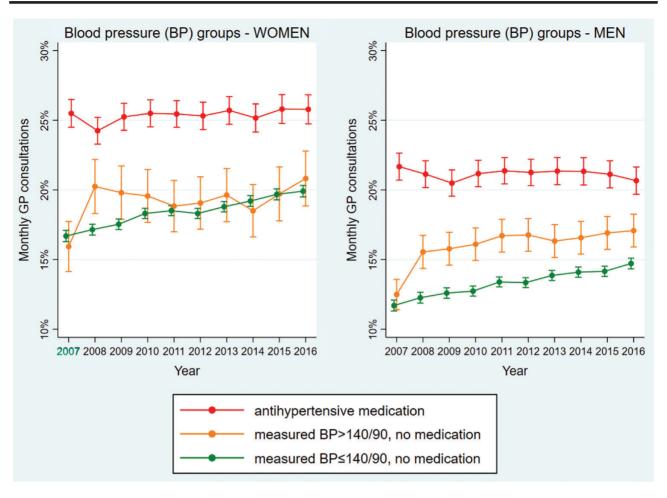
Figure 1. Hypertension groups: estimated percentage with monthly GP consultations per year for the cohort aged 40–59 years in 2007. Adjusted for increasing age and education.

use of GP services in men with high symptom levels of anxiety and depression allows for reflection given the elevated risk of suicide in men with depression (32). These findings underscore the importance of gender in explaining health care utilization and when considering potential overuse and underuse of available services.

The study period covered the implementation of a major Coordination Reform between Norwegian health services, which has been suggested to add an extra burden to GP workload (8). However, we did not find any trend changes corresponding to the timing of the reform for any of our patient groups in line with studies investigating other diagnoses for a shorter time span (33).

Despite hypertension and anxiety/depression being substantially different health problems, our affected groups had surprisingly similar development in their consultation frequency across the study period. Compared with groups with lower symptom levels, they did not show a marked increase over the 10-year period. However, while those with hypertension had stable levels of GP consultation, the groups most heavily affected by anxiety/depression symptoms showed decreasing consultation trends. This difference could be related to the standardized follow-up of hypertensive patients according to guidelines in contrast to patients with common mental disorders for whom follow-up is more based on help-seeking behaviour. Since men, in general, use fewer health services, this could explain why men with anxiety/depression showed a more pronounced decrease in GP consultation compared with women. We found an increase in GP consultations among those with non-medicated hypertension during

the HUNT3 period (2006–08), likely a direct consequence of the clinical examination (participants received information about their test results, including recommendations to visit their GP in case of high values on, e.g., blood pressure). This 'post-screening' effect of increased consultations after HUNT3 participation wore off among women but not among men, raising the question of possible underuse of GP services before HUNT3 participation among men. No information was given to participants with elevated HADS score, thereby explaining why no change in consultation patterns was observed according to the time of HUNT3 for anxiety/depression groups.

The consultation patterns were fairly similar between GPs. Norwegian GPs have a high degree of autonomy, displaying differences in meeting participation (34), referral to specialist health services (35–38) and carrying out practical procedures (39). We found substantial variability between GPs in the use of consultations exceeding 20 minutes but low variability regarding regular or out-of-hours consultations. All variability estimates were stable through the study period and remained unchanged after adjustment for patient and GP characteristics. The low and stable variability in use of out-of-services between patient lists indicates a low degree of spill-over from regular GPs, even as workload increased.

Conclusion

This study indicates an increased use of GP services in Norway partly due to changes in help-seeking behaviour among the healthier part
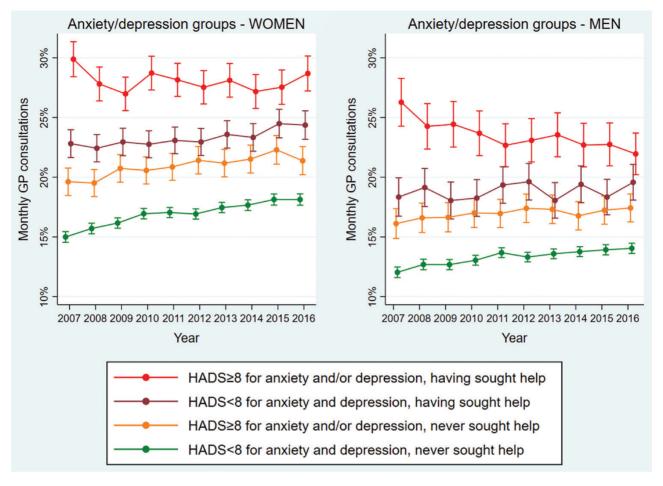
Figure 2. Anxiety/depression groups: estimated percentage with monthly GP consultations per year for the cohort aged 40–59 years in 2007. Adjusted for increasing age and education.

Table 2. ICC between the different GPs and their patients regarding the yearly number of consultations, yearly number of GP consultations exceeding 20 minutes and number of yearly out-of-hours service consultations

Year	GP consultations (95% CI)	GP consultations >20 minutes (95% CI)	Out-of-hours consultations (95% CI)
2007	0.03 (0.02 to 0.04)	0.08 (0.06 to 0.11)	0.02 (0.01 to 0.02)
2011	0.03 (0.02 to 0.04)	0.11 (0.09 to 0.14)	0.01 (0.01 to 0.01)
2016	0.02 (0.02 to 0.03)	0.10 (0.08 to 0.13)	0.01 (0.01 to 0.01)

Calculated at three different years to investigate changes over time and adjusted for patient sex and patient age.

of the population; those with 'normal' range of anxiety/depression symptoms who 'never' sought help for mental health problems and those with normotension and no antihypertensive treatment. More frequent consultations could indicate better prevention, monitoring and treatment. However, as GP services are under considerable capacity pressure, prioritization principles and the balance between follow-up of people with different needs is a topic for further scrutiny. It should be further investigated whether patients with heavier and more complex needs are displaced by a healthier population or cared for in other primary care services. Further, it is important to consider whether the increase in consultations has spillover effects in terms of referrals to specialist services.

Supplementary material

Supplementary material is available at *Family Practice* online.

Acknowledgements

Declaration

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